



## **NORTH CAROLINA**

Department of Transportation



# Board of Directors Operations Committee Meeting

North Carolina Turnpike Authority  
June 15, 2017



## **NORTH CAROLINA** Department of Transportation



# Toll Project Development Policy

Gene Conti

# Purpose

Secretary Trodgon committed to development of a comprehensive policy regarding use of tolling by the department.



# General Assembly Support

*“Establishing policies and guidelines will allow for the Department to make informed decisions when selecting projects as toll candidates and is critical to moving the state forward. Understanding which project characteristics make a project viable for tolling, managed lanes, or a (P3) agreement is necessary in gaining public trust.”*

*Senators Meredith, Davis, McInnis and Rabon  
April 6, 2017*

# Study Process

- Establish an internal working group to develop an informational baseline
- Actively engage stakeholders
- Provide study updates to Board of Transportation and Turnpike Authority Board
- Deliver final report to Secretary and Board of Transportation

# Considerations

- Ongoing funding needs – building on 2040 Plan findings
- State and federal regulations
- Opportunities created by STI
- Review of other state programs
- Economic impacts of toll projects
- Key stakeholder input – regional planning partners, local governments, business community and freight industry



# Next Steps

- Stakeholder meetings in June and August
- Internal policy development workshops in July and August
- Recommendations to the Secretary and Board of Transportation in late summer



# Questions?





## **NORTH CAROLINA**

Department of Transportation



# Express Lanes Toll Rate Policy

David Roy, Director of Finance

The background of the slide is a dark blue gradient with a complex pattern of glowing blue lines, arrows, and gears, suggesting a high-tech or cyber environment. A large, stylized padlock is positioned in the center-left, with its body forming a shield shape. The padlock is white with a blue outline and a blue keyhole. The text "CYBER SECURITY OVERVIEW" is written in a bold, white, sans-serif font, positioned to the left of the padlock's body. The text is split into two lines: "CYBER SECURITY" on the top line and "OVERVIEW" on the bottom line.

# **CYBER SECURITY OVERVIEW**

***KEVIN PALMER, PE, PMP***

***RS&H TOLLS TECHNOLOGY LEADER***



# AGENDA

*WHAT IS CYBER SECURITY?*

*WHAT IS PAYMENT CARD INDUSTRY  
CERTIFICATION?*

*HOW DOES NCTA IMPLEMENT CYBER  
SECURITY?*



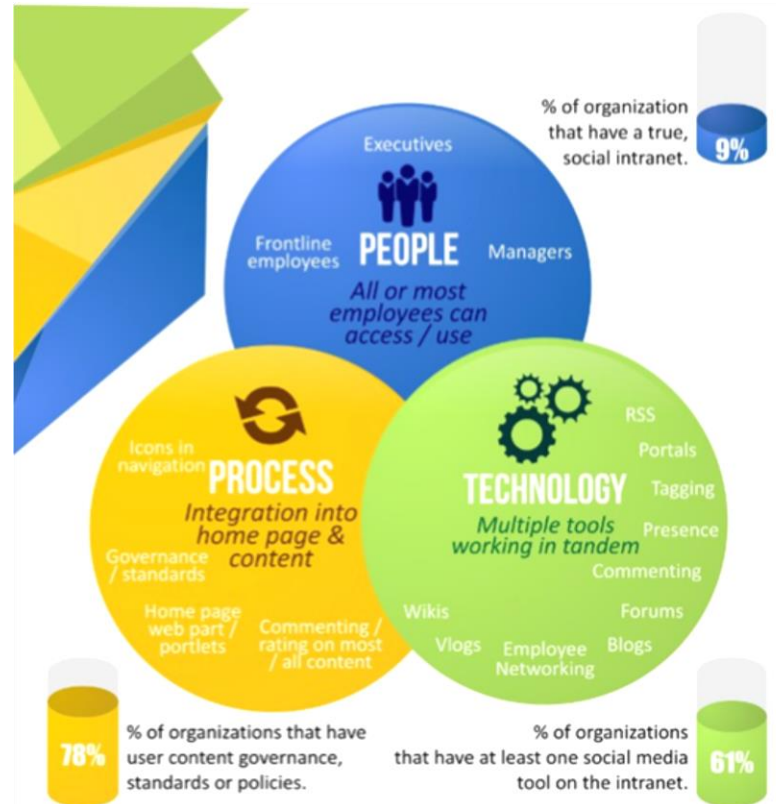
# Cyber Security Overview

- » **Comprehensive Solution**
- » Technology
- » Policies & Procedures





# Cybersecurity Components – Security Triangle



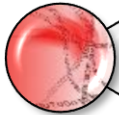
# Payment Card Industry Certification

- » The Payment Card Industry (PCI) standard is a set of requirements designed to ensure that ALL organizations that Store, Process, or Transmit cardholder data do so in a secure environment.



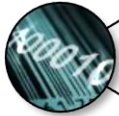


# Payment Card Industry Goals



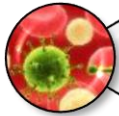
## **Keep up with threat intelligence**

Build and Maintain a Secure Network. Protect Card Holder Data



## **Maintain a current and accurate asset inventory**

Strong Access Control thru Approvals, Roles, Privileges, Password protection



## **Have a patching solution that covers your entire infrastructure**

Maintain a Vulnerability Management Program



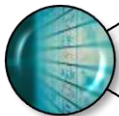
## **Implement mitigating controls**

Data: Need to know basis – Only Authorized People and Purpose



## **Instrument your environment with effective detection**

Regularly Monitor and Test Networks

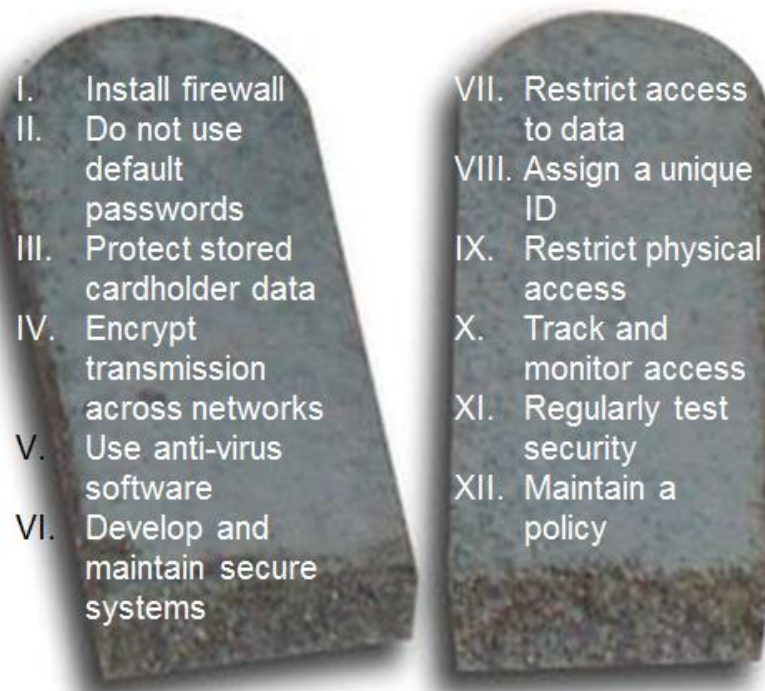


## **Create and practice a broad incident response plan**

Maintain an Information Security Policy

# Payment Card Industry Certification Requirements

## The Twelve Requirements

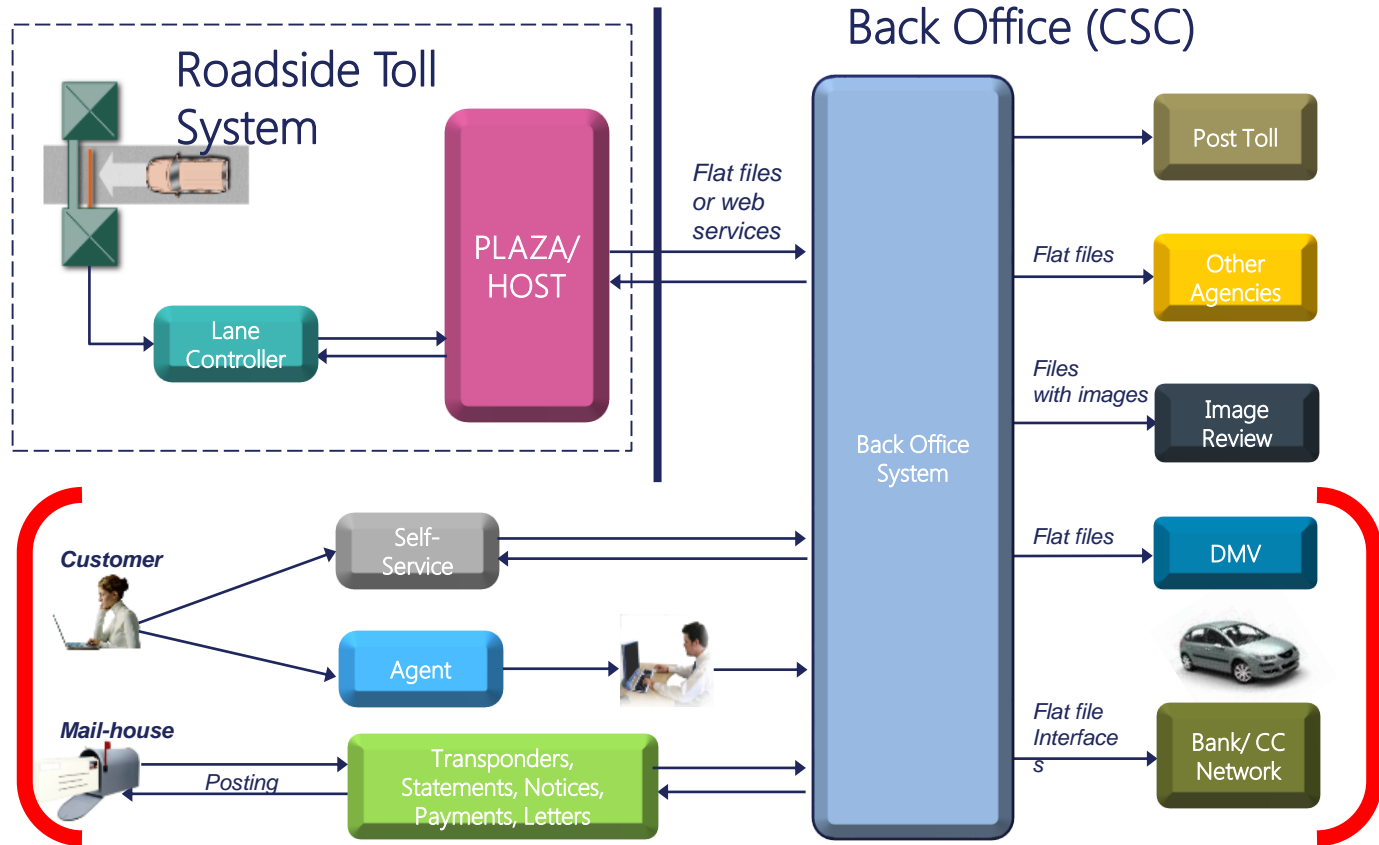
- 
- The image shows two stone tablets, similar to the Ten Commandments, standing side-by-side. Each tablet contains six of the twelve PCI requirements, numbered I through XII. The tablets are dark grey with a slightly weathered texture and have rounded tops.
- I. Install firewall
  - II. Do not use default passwords
  - III. Protect stored cardholder data
  - IV. Encrypt transmission across networks
  - V. Use anti-virus software
  - VI. Develop and maintain secure systems
  - VII. Restrict access to data
  - VIII. Assign a unique ID
  - IX. Restrict physical access
  - X. Track and monitor access
  - XI. Regularly test security
  - XII. Maintain a policy

# PCI Compliance - PCI Data Security Standards (DSS) Tests

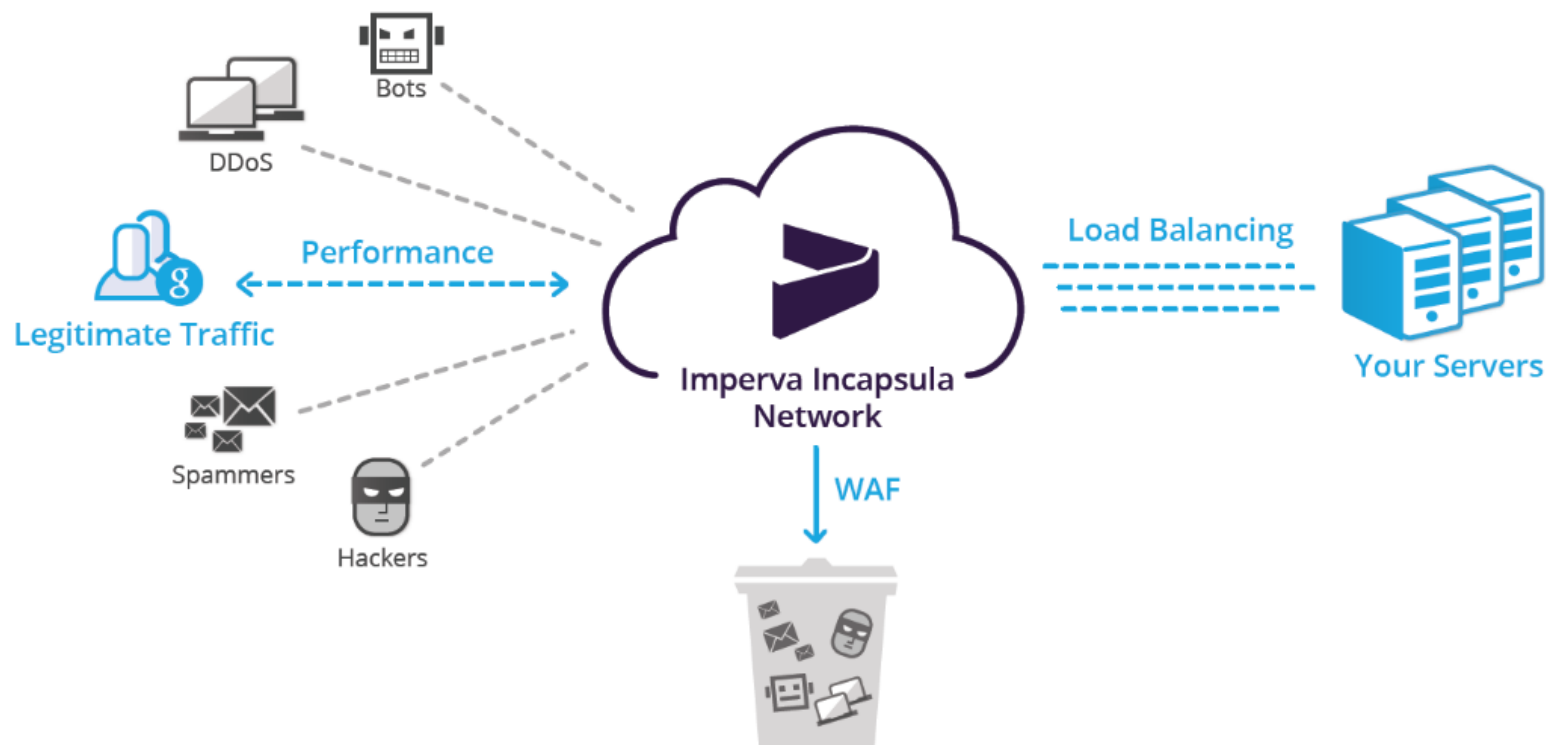
- » Roughly 260 Tests
- » Conducted Annually
- » Third Party Certification



# Electronic Toll Collection System – PCI Segmentation



# NCTA Cloud Based Web Application Firewall (WAF)

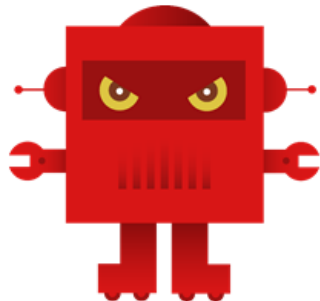


# What Are We Looking For in all that Traffic?

- Hackers + Crackers,
- Malicious IPs
- Proxied, Deceptive Routing
- Abnormal Web Requests
- Abnormal Network Packets
- Marker Traffic We Specify

Harmful Bots of all kinds –

- Scrapers
- Scanners
- Spammers
- Spies



Our Overall Objective:

Filter out all malicious traffic;  
streamline and accelerate  
what's left.

Security  
Performance  
Availability



Security



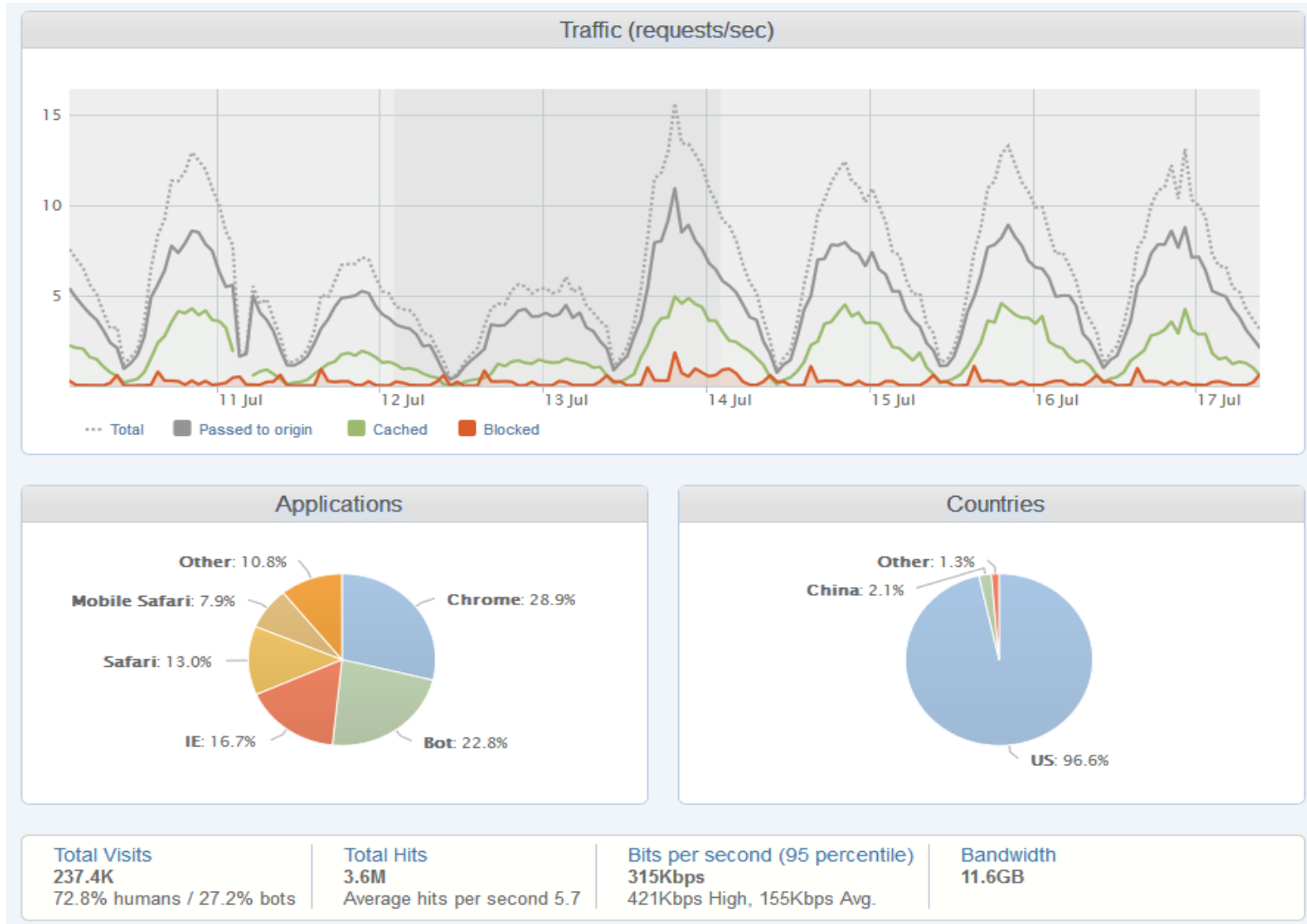
Performance



Availability

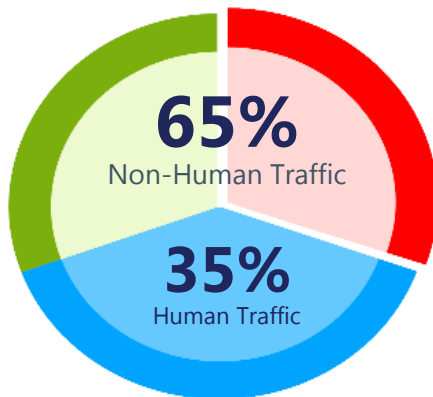


# Sample of Basic Cloud WAF Report – 7 Days' Traffic



# Humans vs Bots on the typical Web Site

~ **65%** of all website traffic is non-human.



**1/2** +  
of that Bot traffic is

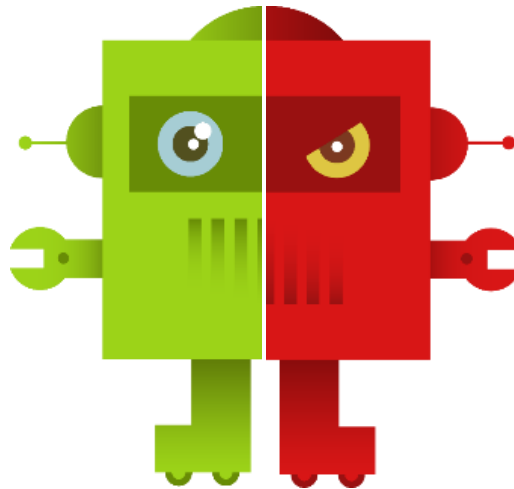
**malicious !!**



# Bots' Impact on Website Security

## Good Bots

- Search Engine Crawling
- Website Health Monitoring
- Vulnerability Scanning
- Fetching Content
- Powering APIs



## Bad Bots

- Site Scrapers
- Malware Delivery Bots
- Vulnerability Scanners
- Denial of Service
- Comment Spammers
- Scammers

# Dealing with a Breach?

- » NCDOT / NCTA Policies
- » State Controller Policies
- » Contractor Policies
  - Back office provider
  - Back office staffing contractor



# What Does the Future Hold?

## Tokenized Approach to Card Storage



# Summary

- » Cyber Security is a moving target
- » Tools to secure systems are constantly evolving
- » NCTA has implemented required controls and procedures
- » NCTA adheres to Payment Card Industry Standards
- » NCTA closely monitors all impacted systems and processes







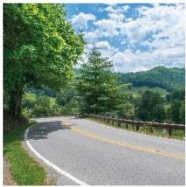
***THANK YOU!***

***RS&H***



## **NORTH CAROLINA**

Department of Transportation



# Maintenance Rating Program (MRP) Overview

Andy Lelewski, P.E.



# Maintenance Rating Program

Program to manage NCTA's asset inventory over a period of time in order to meet designated performance levels in the most cost-effective way

# Agenda

## Maintenance Rating Program (MRP)

- Purpose and Requirements
- Methodology
- Program Cost
- Next Steps

# Purpose and Requirements

- Customer focused - Meet expectations of traveling public
- Budgeting - Allocate appropriate levels of funding
- Life Cycle - Prioritize routine maintenance and plan for long-term maintenance and major rehabilitation
- Accountability - Provide reporting to stakeholders



# Purpose and Requirements

## MAP-21 Requirements

- “Each state is required to develop a risk-based asset management plan for the National Highway System (NHS) to improve or preserve the condition of the assets and the performance of the system.”

*23 U.S.C. 119(e)(1), MAP-21 § 1106*

- “USDOT is required to issue a regulation not later than 18 months after date of enactment, after consultation with the States and other stakeholders, which will establish the process to develop the State asset management plan for the NHS.”

*23 U.S.C. 119(e)(8), MAP-21 § 1106*



# Purpose and Requirements

- Asset management is the
  - “strategic and systematic process of operating, maintaining, and improving physical assets, with a focus on engineering and economic analysis based upon quality information, to identify a structured sequence of maintenance, preservation, repair, rehabilitation, and replacement actions that will achieve and sustain a desired state of good repair over the lifecycle of the assets at minimum practicable cost.”

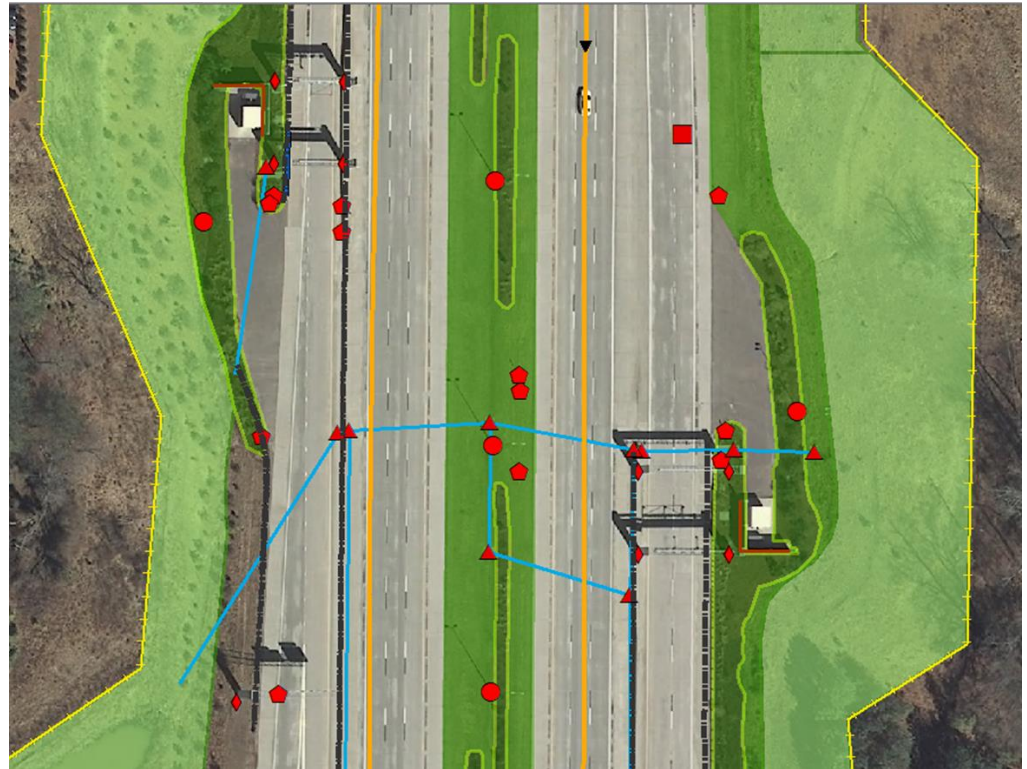
*23 U.S.C. 101(a)(2), MAP-21 § 1103*

# Methodology

- Program relies on a systematic approach that produces numerical ratings to quantify and compare results
  - Asset Database (ArcGIS)
  - Performance Standards
  - Assessment
  - Ratings
  - Reporting

# Asset Database

- Maintained in ArcGIS
- Updated regularly to account for changes in asset inventory
- Source for asset selection for quarterly inspections



# Performance Standards



## NCTA Roadway and Facility Maintenance Performance Standards

ELEMENTS (Target Score 85)	CHARACTERISTICS (Target Score 80)
<b>1. Road Surface</b>	Paved Lanes Asphalt Paved Lanes Concrete Paved Shoulder
<b>2. Unpaved Shoulders &amp; Ditches</b>	Unpaved Shoulder Front/Back Slopes Lateral and Outfall Ditches, Unpaved Ditches, Paved
<b>3. Drainage</b>	Drainage Pipes Curb and Gutter Inlets Misc. Drainage Structure
<b>4. Roadside</b>	Turf Condition Landscaping Trees and Brush Litter Roadway Sweeping Guardrail, Concrete Barrier and End Anchors Impact Attenuators Fence, Control Access Retaining Walls and Sound Barrier Walls Decorative Supports Graffiti and Stain Removal
<b>5. Traffic Control Devices</b>	Signs Delineators Pavement Striping/Marking Words and Symbols Pavement Markers Highway Lighting



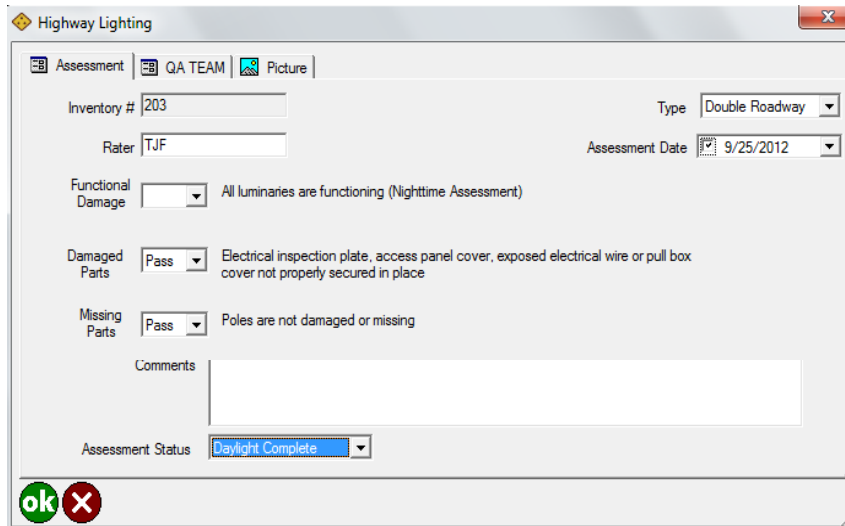
# Assessment

- Conducted quarterly
  - Accounts for dynamic changes in assets during each season
- Assess nearly 500 assets each quarter
  - Random sampling process
  - 95% confidence level
- Daytime and nighttime inspections lasting 1 week
- Two inspectors



# Assessment

- Use tablets (ArcPAD)
  - Accurate asset location
  - Efficient evaluation process (Pass/Fail scores)
- Results transferred to asset database
  - Processed in ArcGIS and Microsoft Excel



The screenshot shows a software window titled "Highway Lighting" with a tabbed interface. The "Assessment" tab is active, showing a form for data entry. The form includes fields for "Inventory #", "Type", "Rater", and "Assessment Date". Below these are sections for "Functional Damage", "Damaged Parts", and "Missing Parts", each with a dropdown menu and a descriptive text area. A "Comments" text box is at the bottom, followed by an "Assessment Status" dropdown menu. The window has a standard Windows-style title bar and a small icon in the bottom left corner.

Highway Lighting

Assessment | QA TEAM | Picture

Inventory # 203 Type Double Roadway

Rater TJF Assessment Date 9/25/2012

Functional Damage All luminaries are functioning (Nighttime Assessment)

Damaged Parts Pass Electrical inspection plate, access panel cover, exposed electrical wire or pull box cover not properly secured in place

Missing Parts Pass Poles are not damaged or missing

Comments

Assessment Status Daylight Complete



# Example: Signs

- 144 signs to be inspected in 2017
- Performance Standard
  - Clear, reflective, and legible to driver at a distance of 320 feet
  - Surface 90% free of damage affecting sign function
  - Sign posts are plumb (less than 1" per ft of length)
  - Lights on signs, where required, are functional





# Example: Drainage

- 120 miscellaneous drainage structures to be inspected in 2017
- Performance Standard
  - More than 50% of the structure (length and depth) is unobstructed
  - End protection has no deteriorations, erosions, washouts or buildups adversely affecting the natural flow of water



# Ratings

Target ratings:

- Overall = 90
- Element = 85
- Characteristic = 80

Element	Q1 MRP Rating	Q2 MRP Rating	Q3 MRP Rating	Q4 MRP Rating	2016 Annual MRP Rating
Road Surface	98	100	99	98	99
Unpaved Shoulders and Ditches	98	100	100	100	99
Drainage	93	91	88	94	91
Roadside	92	83	90	94	90
Traffic Control Devices	93	96	90	88	92
<b>Overall MRP Performance Rating</b>	<b>94.9</b>	<b>94.7</b>	<b>93.4</b>	<b>93.9</b>	<b>94.2</b>

# Reporting

- Quarterly and Annual Reports
- Provided to NCTA Board Members
- Posted to NCTA website



# Program Costs

- Inspection Expenses (FY 2016 = \$80K)
  - Assessment
  - Database management
  - Reporting
- Routine Maintenance Expenses (FY 2016 = \$1.21M)
  - Construction Administration and Management
  - Pavement (repairs and maintenance)
  - Roadside (mowing, landscaping, seeding)
  - Traffic (pavement marking, lighting, signs)
  - Other (snow removal, ditches, drainage)

# Next Steps

- Systems integration for tracking maintenance activities
- Addition of new interchanges (Triangle Expressway)
  - Veridea Parkway
  - Morrisville Parkway
- Scalable Program for Future Projects
  - Monroe Expressway
  - US 74 Express Lanes
  - I-485 Express Lanes

QUESTIONS?